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ABSTRACT

The four projects in management analysis described in this report are interrelated parts of a planning and development scheme in selected areas of the Chicago public school system. One project, the long-range system-wide planning process, is the means whereby the school system determines its multi-year priorities. A recommended strategy for implementation of the process is included in this report. Building-level information is provided in the school profiles project, in such areas as staffing, teacher characteristics, class size, program budgeting, school safety and environment. These profiles are used to assess trends and make comparisons between schools as well as being utilized in the goal setting process by administrators. The management development program, on the other hand, provides a means to reduce costs and improve the quality of education services by improving the management skills of school personnel. The project encompasses ten tasks which involve indentifying each job task, forecasting employment needs, and developing job-related instructional programs for personnel. The research on long run changes in the composition of the labor force in the Chicago public schools will provide critical information on staffing trends for the management development program.
(Author/KR)

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MANAGEMENT ANALYSIS IN THE CHICAGO PUBLIC SCHOOLS

Research in Progress Report
Division A
AERA
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March 27-31, 1978

by

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INTRODUCTION

The Center for Urban Education is a vehicle for carrying on system-wide long-range planning and development in a select set of areas for the Chicago public schools. The four projects in management analysis described here comprise one part of the Center's planning and development agenda for the 1977-78 year. Additional information on the Center for Urban Education is included in separate brochures which accompany this document.

The Long Range System-Wide Planning Process is the means whereby the school system determines its multi-year priorities. The system-wide plan will enable the school system to coordinate planning activities at several levels and will facilitate the planning of other units. A recommended strategy for implementation of the process is also included.

The School Profiles provide critically needed building-level information for the Long Range System-Wide Plan in areas such as staffing, teacher characteristics, class size, program budgeting, and school safety and environment. These profiles are utilized in the goal setting process involving building principals, district superintendents, and the Deputy Superintendent for Field Services. They are also used to assess trends and make comparisons between schools.

The Management Development Program provides a means to reduce costs and improve the quality of education services by improving the management skills of school personnel. The project encompasses ten tasks which involve identifying each job task,

analyzing the job skills necessary to perform each job, forecasting employment needs and developing job-related instructional programs for personnel.

The research on Long Run Changes in the Composition of the Labor Force in the Chicago public schools will provide critical information on staffing trends for the Management Development Program. The activities of the research include analysis of changes in the labor force over the last 10 years, isolating the most significant of these changes, and measuring the stocks and flows of individuals entering and leaving the school system.

All four of these projects are interrelated and dependent on each other for a comprehensive management analysis of the Chicago public school system. These projects will enable the Chicago Board of Education to develop and administer programs that will contribute to its needs for organizational efficiency and responsiveness.

DESIGN FOR THE LONG RANGE SYSTEM-WIDE PLANNING PROCESS

CHICAGO PUBLIC SCHOOLS

BACKGROUND

An important aspect of the managerial revolution is the increasing recognition of planning as a basic management function within all forms of enterprise, profit as well as non-profit. To date, much of the interest in planning has been due to pressures of crisis management rather than pro-active management choice or decision. Nonetheless, we are in an era of economic, technological, social and political change in which planning has become requisite for organizational growth or even survival. Change brings opportunity, but it also brings risk. It is precisely the task of planning to minimize risk while concurrently taking advantage of all opportunities. To plan well — to make plans that will succeed -- the activity must take place in a context of well-conceived principles, structure, implementation phases and follow-up.

A good long range plan will provide a means to:

1. reduce uncertainty and unanticipated change through positive action;

2. focus attention on objectives and plans of action and a subsequent means of evaluation;

3. gain and maintain economy and efficiency of operation; and

4. facilitate control and communication.

A formalized and structured planning process will contribute to organizational success by enhancing the decision-making process. Furthermore, it will be sufficiently flexible to allow for expansion or embellishment during subsequent planning cycles in future years. Such a planning process will enhance decision-

making in the Chicago public schools by the:

1. identification and examination of long term environmental threats and opportunities which will shape or influence the school system;

2. articulation and communication of objectives, strategies, goals, action programs and contingency plans for use both internally and externally to the school system; and

3. establishment of accountability by providing standards of control for the monitoring of performance and feed-back within the system.

In light of the importance of planning, the Long Range Planning Task Force, consisting of five corporate planners and eight Chicago public school employees, was convened by the General Superintendent in August 1977. The charge to this Task Force was to design a long range planning process for the Board of Education of the City of Chicago. Such a planning process incorporates the principles of long range planning developed in other organizations and reflects the operating realities of the Chicago public schools.

The Task Force met on the average of once every two weeks from August through November 1977. The major topics of consideration during that period of time included methods of long range planning as well as current programs, practices, and organization of the Chicago public schools. The products of these discussions include: a recommended design for a long range planning process and a recommended strategy for its implementation.

The purpose of this Task Force differs from that of previous ventures into planning, such as the efforts of Leu and Candoli (Planning for the Future: A Recommended Long-Range Educational and Facilities Plan for Chicago, 1971) and Project Simu-School: Chicago Component (1971-74). Leu and Candoli developed a long-range plan, but concluded their study with the statement that "as soon as any study is printed it becomes obsolete. Planning is a continuous, systematic process -- not a single "cookbook", unchanging solution" (p. 72). As the authors anticipated, their plan is now out of date and a current long-range plan must be developed. In A Data System for Comprehensive Planning in Education (a 1973 Simu-School publication), Higgins and Conrad state that "Comprehensive Educational Planning is a continuous process of (1) establishing goals, (2) gathering data, (3) forming and assessing alternative means of goal achievement and (4) making decisions about these alternatives" (p. 1). The Simu-School materials suggest methods of carrying out each of these individual activities; however, a clear and direct coordination among them is not delineated. The purpose of the Long Range Planning Task Force was to develop a "plan to plan" which would provide for the coordination of planning activities at several levels.

DESIGN OF A LONG RANGE PLANNING PROCESS FOR THE CHICAGO PUBLIC SCHOOLS

The long range planning process can best be described as one of assembling, reviewing, and interrelating three discrete types of plans which differ in level of detail and degree of comprehensiveness. These three types of plans are developed in a generally sequential manner during a twelve month period, although there is a great deal of overlap among them during their development. Each plan has a variety of ingredients. The three types of plans are described below, followed by a description of how they are linked together and scheduled.

Type I: The System-Wide Long Range Plan

The system-wide plan is a description in general terms of the strategies which will be used to achieve the system-wide goals and objectives. Thus the first component of the system-wide plan is a statement of the system-wide goals and objectives. The current goals and objectives were revised on July 14, 1976 and adopted at a General Committee Meeting of the Board of Education on August 11, 1976. Listed under each of the nine system-wide goals are several more specific objectives which clarify the goals. These goals and objectives should be reviewed at the beginning of each planning cycle by the General Superintendent, the four deputies, and members of the Board of Education. Primary responsibility for this task rests with the Board of Education. The revised system-wide goals and objectives should be a major inclusion in the system-wide long range plan.

The second major ingredient of the system-wide plan is a narrative summary of the most important factors which will affect the way in which the goals and objectives are to be achieved. Such factors include, for example, descriptions of trends in revenues, regulations, population and contracts. The implications of these factors, if they are not obvious, should be summarized here. The narrative summary should also include a description of the major strengths and weaknesses facing the system. Strengths are those positive aspects of the system which can be built up upon; weaknesses are problems which are not being corrected in an effective and timely fashion. Above all else, the narrative summary should assist the reader in relating the goals of the system to the specific strategies of the system. In other words, the subject matter of the narrative summary is the same as that implied in the system-wide goals and objectives. Primary responsibility for the task of writing the narrative summary rests with the Office of the General Superintendent.

A third major piece of the system-wide plan is a set of statements about system-wide strategy. These statements are specifications of broad courses of action assumed to be the best methods of attaining the system-wide goals. Where possible, these statements describe the required resources implicit in each strategy, e.g., people, time, and money.

These three parts -- the system-wide goals and objectives, the summary of important factors to consider, and the statements of major strategies to be employed -- constitiute the system-wide long range plan. All three parts reflect about a five year time horizon;

that is, the system-wide plan should explain to the reader where management intends to direct its efforts over the next five years.

The primary purpose of the system-wide long range plan is to provide direction to the lower levels of management within the organization. In order for the system-wide plan to have an effect on the behavior at lower levels in the organization, it should be accompanied by planning guidelines which tell managers what is expected in order to develop their second level plans.

Type II: Second Level Plans

Although there is one system-wide plan, there are at least sixty second level plans, which are specialized responses to the system-wide plan. Their time horizon is shorter than that of the system-wide plan (three years as opposed to five). They are developed by each unit manager under the supervision of the appropriate superior. Specifically, second level plans are developed by those units reporting to Deputy Superintendents as well as those staff units reporting to the Office of the General Superintendent. The second level plans which should be developed are those portrayed on the following page.

Each second level plan consists of two general parts. The first part contains a listing of those strategies delineated in the system-wide plan which the individual unit will endeavor to support and a description of goals, strategies, and objectives which will be used by that unit to achieve the selected parts of the system-wide plan. In this section, the unit manager is saying, in effect, "Here is how my unit is helping the system to achieve

SECOND LEVEL PLANS

DEVELOPED UNDER THE GENERAL SUPERINTENDENT OF SCHOOLS

BY THE FOLLOWING:

(DEPARTMENTS REPORTING DIRECTLY TO THE GENERAL SUPERINTENDENT)
- Department of Internal Audit
- Department of Administration
- Department of Employee Relations
- Department of Research and Evaluation
- Department of Community Relations
- Bureau of Multilingual Education
- Department of School Safety and Environment
- Center for Urban Education

(DEPARTMENTS REPORTING TO THE DEPUTY SUPERINTENDENT-FIELD SERVICES)
- District 1
- Districts 2 and 24
- District 3
- District 4
- District 5
- District 6
- District 7
- District 8
- District 9
- District 10
- Districts 11 and 23
- District 12
- District 13
- District 14
- District 15
- District 16
- District 17
- District 18
- District 19
- District 20
- District 21
- District 22
- District 25
- District 26
- District 27

(DEPARTMENTS REPORTING TO THE DEPUTY SUPERINTENDENT-FINANCE SERVICES)
- Department of Financial Planning and Budget Preparation
- Department of Control
- Department of Systems Analysis and Data Processing
- Bureau of Affirmative Action

(DEPARTMENTS REPORTING TO THE DEPUTY SUPERINTENDENT-MANAGEMENT SERVICES)
- Department of Maintenance and Rehabilitation
- Department of Government Funded Programs
- Department of Personnel
- Department of Operation Services
- Department of Management Services
- Bureau of Facilities Planning

(DEPARTMENTS REPORTING TO THE DEPUTY SUPERINTENDENT-INSTRUCTION AND PUPIL SERVICES)
- Department of Curriculum
- Department of Vocational and Career Education Program Development
- Bureau of Reading Improvement
- Department of Program Development/Alternative Schools
- Department of Pupil Personnel Services and Special Education Program Development
- Department of Federal and State Relations
- Bureau of Staff Development

the system-wide goals and objectives."

The second part of this plan contains a description of those factors which influence the selection of strategies which will help the unit to achieve its goals. Such factors may include trends which are affecting the unit, as well as an analysis of the unit's strengths and weaknesses. This part may contain a description of unresolved issues affecting the operation of the unit but requiring action at a higher level. This section also includes an aggregate summary of the financial impact of the unit's plans. In this section, the unit manager is saying, in effect, "Here is why my unit is proposing to do what it has."

In the case of the plans developed by the District Superintendents, it will be necessary to develop guidelines and instructions for transmittal of the plans to the school building level. The other second level unit plans (with a few exceptions) will not require transmittal downward.

Type III: Building Level Plans

One building level plan is developed for each separate instructional facility in the system. Each plan is a response to the district (second level) plan of which it is a part. Each of these plans is relatively short range (two years) and describes how programs in that building will support district level goals. Like the second level plans, these plans consist of two parts. However, the descriptions of what will be done and why are even more specific.

Linking the Three Levels of Plans

In several respects, the planning process described here is "top down": planning activity is initiated in the upper echelons of management and is filtered down through the organization to successively lower levels of management. The system-wide plan is comprehensive and general. It provides a basis and a direction for developing the second level plans which are more specialized and detailed. Some of these plans, those of the District Superintendents, in turn provide a basis and direction for the building level plans.

During the planning process, lower level (e.g., building) plans need to be reconciled with higher level (e.g., district) plans. Also, plans need to be reconciled with each other at the same level (e.g., the facilities requirements emanating from pupil personnel services must be reconciled with facilities planning). Reconciliation among plans takes place through an extensive review process. District Superintendents work with principals to reconcile building level and district level plans. The General Superintendent and the four Deputy Superintendents work with those who prepare the second level plans in order to reconcile the second level and system-wide plans. Any level plan can be modified during this process of review and reconciliation.

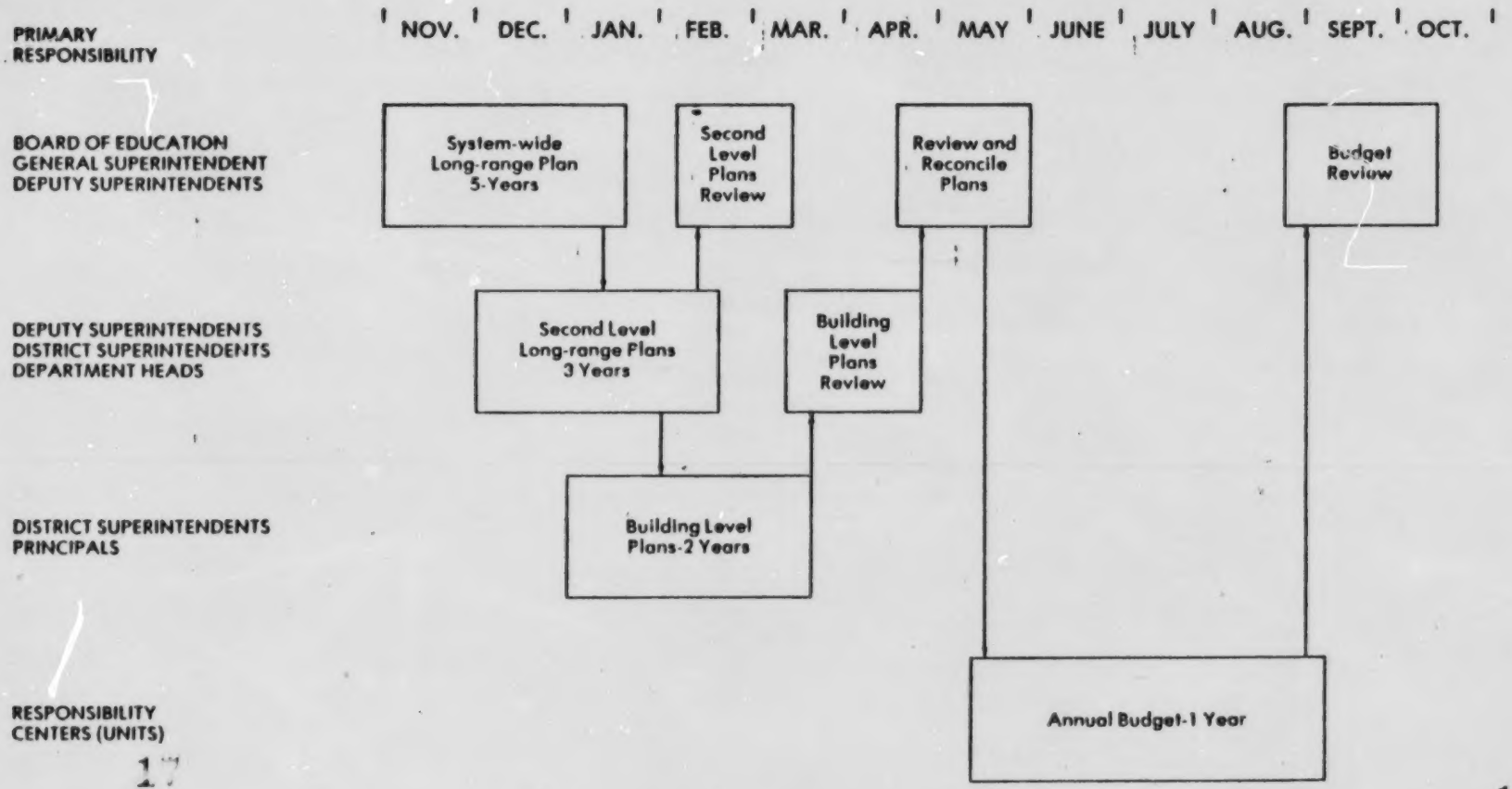
Because of the need to reconcile the various plans, they cannot be developed in a strictly sequential manner. Each of the three levels of plans requires about ten weeks to develop. About five weeks into the development of the system-wide plan, preliminary pieces of the system-wide plan are transmitted to

those administrators responsible for developing second level plans. In a similar fashion, about half-way through the development of second level (district) plans, work begins on the third level (building) plans.

Linking the Planning Process to Budget and Control Decisions

After the three levels of plans have been developed and reconciled, they are used as one basis for decision on the annual budget. About four or five months are required to develop short range (one year) spending plans and to reconcile these with long range objectives. The three levels of plans are also used as a general guide for managerial decision-making during the following school year. Progress toward objectives is assessed at all levels in the organization. The approximate schedule of the planning and review process is portrayed on the following page. Note that this planning process is ongoing; that is, the entire process is repeated annually.

CHICAGO PUBLIC SCHOOLS
Long-Range Planning Process: Proposed Sequence of Plans



IMPLEMENTING THE PLANNING PROCESS

The steps toward implementing a long range planning process are summarized by Alvin C. Eurich ("Plan or Perish", College and University Journal, Summer 1970) as follows:

1. The governing body establishes a commitment to plan;

2. An administrative officer responsible for planning is designated;

3. All relevant information is collected; and

4. Specific and realistic recommendations are formulated.

Steps 3 and 4 amount to the ongoing process of planning, which has been elaborated above. Steps 1 and 2 need to be completed only once, although the indicated commitment and responsibility must be maintained as long as successful plans are desired. These two steps can be completed by the establishment of a separate unit (perhaps a department level unit) for long range planning. This unit should be charged with the responsibility for implementing the long range planning process described above.

As suggested by Gerald H. Gaither ("The Imperative to Plan in Higher Education", North Central Association Quarterly, Fall 1977), "the planning staff should be based close to the top of the organizational hierarchy but generally remain in a staff function" (p. 351). Thus the unit should be headed by someone at a relatively high level in the organization (such as an Assistant Superintendent); the head of the long range planning unit should report directly to the General Superintendent of Schools. The unit should be housed at the Center for Urban Education, since the

primary function of the Center for Urban Education is " to provide a mechanism for carrying on strategic system-wide planning and development of a select set of program areas".

The long range planning unit does not plan for other units. Rather, it is responsible for managing the planning process of the other units in the Chicago public schools. In pursuing this function, the long range planning unit would undertake the following major tasks:

1. Prepare a multimedia presentation on the general design and purpose of the long range planning process;

2. Prepare planning manuals listing activities to be undertaken, time schedules for the activities, procedures to be followed and forms and formats to be submitted with individual plans;

3. Design and conduct workshops on the long range planning process in cooperation with the Administrative University staff;

4. Coordinate long range planning activities with those of budget preparation;

5. Evaluate the quality of plans that are prepared and make recommendations for improvement;

6. Analyze plans in order to identify discrepancies between levels and across other units;

7. Facilitate the acquisition of management information needed to aid unit managers as they develop plans (for example, providing the school profiles for school principals);

8. Synthesize the various levels of plans and prepare an "overview" document which describes trends which are not otherwise apparent in the long range plan; and

9. Prepare and circulate copies of the annual long range plan.

These activities will, of course, need to be synchronized with the actual development of the plans. For example, the planning manuals and workshops need to be developed to "feed into" the actual development of plans. This particular process is portrayed on the following page.

The long range planning unit should be kept relatively small as its overall purpose is to facilitate the planning of other units, not to do the planning for the other units. The individual chosen to head the long range planning unit should have the following characteristics:

1. Have extensive knowledge (based largely on experience) of all levels of operation of the Chicago public schools;

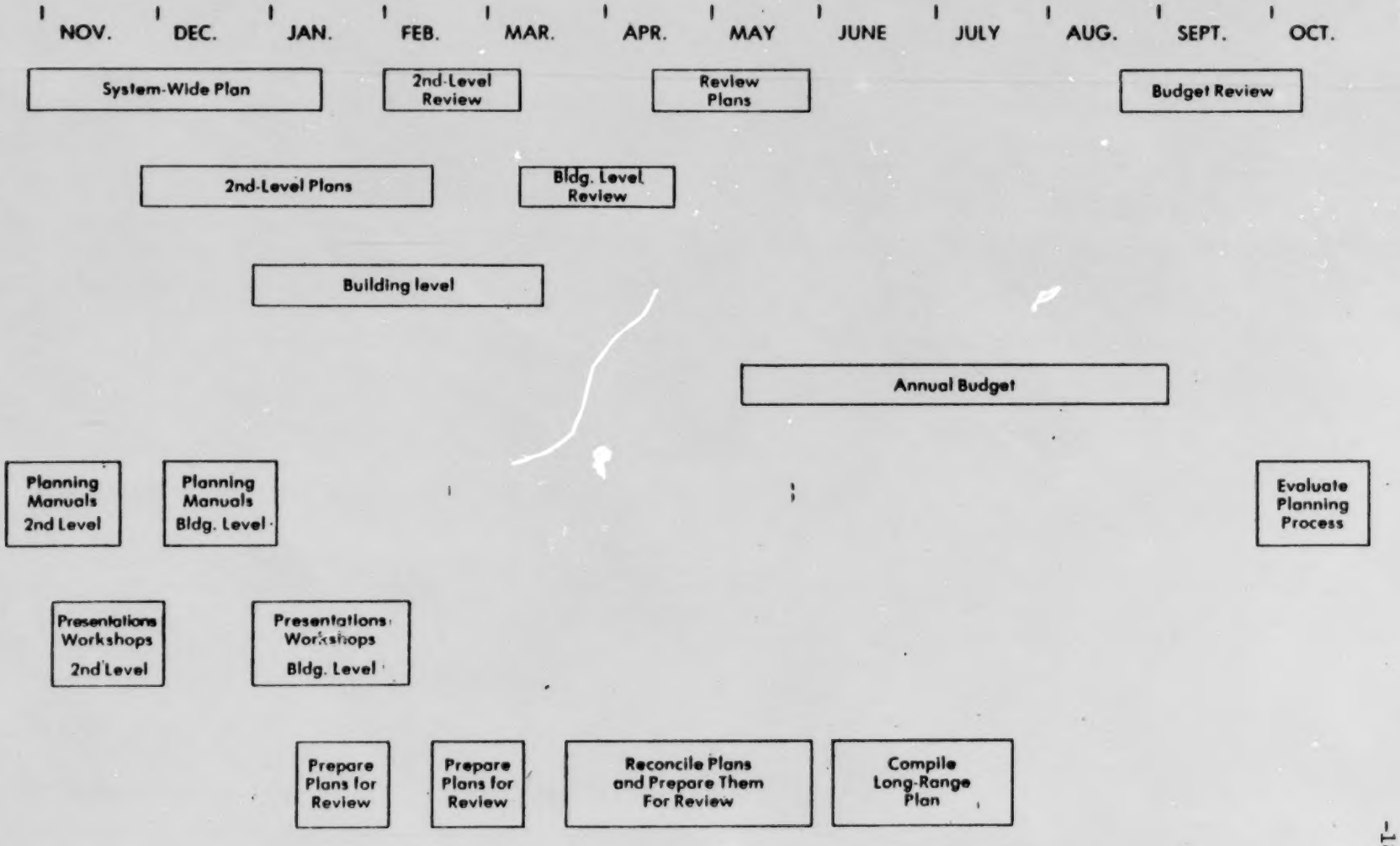
2. Be well grounded in the general principals of long range planning;

3. Have the aptitude to think in abstract terms yet be able to design and implement specific concrete procedures; and

4. Be able to work easily with and secure the cooperation of a wide variety of individuals (including, for example, members of the Board of Education and school principals).

The first step in implementing the long range planning process should be to identify the individual who is to head the long range planning unit. That person should meet with the Long

PROPOSED SCHEDULE OF ACTIVITIES
OF THE DEPARTMENT OF LONG—RANGE PLANNING



Range Planning Task Force to review our deliberations with us and to discuss our recommendations. Finally, the services of the five long range planning directors on the Task Force should be secured on an ad hoc basis to advise this person during the first year of implementation.

DESIGN FOR SCHOOL PROFILES

CHICAGO PUBLIC SCHOOLS

PRELIMINARY DRAFT -- CONFIDENTIAL FOR DR HANNON

UNIT NAME: DISTRICT: UNIT NUMBER: YEAR OF CONSTRUCTION: MONTH OF REPORT:

PRINCIPAL: DATE OF PRESENT ASSIGNMENT: ORGANIZATION: TYPE:

STAFFING	74-75	75-76	76-77	77-78 TO DATE	CURRENT MONTH
PROFILE INDICES:					
# POSITIONS OVERSTAFFED					
# TRUE VACANCY POSITIONS					
STAFFING FORMULA SLIPPAGE					
AVERAGE CLASS SIZE					
PUPIL-TEACHER RATIO					
PUPIL-PARAPROFESSIONAL RATIO					
% CLASSROOM TEACHER ABS COVERED BY SUBS					
# NON-CLASSROOM TEACHER ABS COVERED BY SUBS					
SUBSTITUTE PAY					
BACKGROUND CHARACTERISTICS:					
STAFFING COST PER PUPIL					
# BD FUNDED CLASSROOM TEACHING POSITIONS					
# BD FUNDED AUXILLARY TEACHING POSITIONS					
# BD FUNDED SPECIAL EDUCATION POSITIONS					
# GOV FUNDED TEACHING TEACHING POSITIONS					
# BD FUNDED PARAPROFESSIONAL POSITIONS					
# GOV FUNDED PARAPROFESSIONAL POSITIONS					
PRINCIPAL CHARACTERISTICS					
AGE					
SEX					
RACE					
YEARS AS PRINCIPAL					

TEACHER CHARACTERISTICS	74-75	75-76	76-77	77-78 TO DATE	CURRENT MONTH
PROFILE INDICES:					
TURNOVER RATE					
ABSENTEEISM					
# HOURS LOST					
BACKGROUND CHARACTERISTICS:					
% MINORITY					
% LESS THAN 6 YRS EXP					
% BACHELOR DEGREE ONLY					
PUPIL CHARACTERISTICS					
PROFILE INDICES:					
% ATTENDANCE					
MOBILITY					
RETENTIVITY/ REG YEAR					
RETENTIVITY/ SUMMER					
DROPOUT RATE					
% BEHIND READING LEVEL					
ELEMENTARY READING INDEX					
READING MEDIAN/ AGE 8					
READING MEDIAN/ AGE 11					
READING MEDIAN/ AGE 13					
MEMBERSHIP TREND					
BACKGROUND CHARACTERISTICS:					
MEMBERSHIP/ KG< PRE-KG					
MEMBERSHIP/ REGULAR					
MEMBERSHIP/ SPEC ED					
AV DAILY MEMBERSHIP					
AV DAILY ATTENDANCE					
RACE - % MINORITY					
% AND ETHNICITY OF DOMINANT RACE					
% FROM LOW-INCOME FAMILIES					
% WITH LANGUAGE DIFFICULTIES					

PRELIMINARY DRAFT -- CONFIDENTIAL FOR DR HANNON

UNIT NAME: DISTRICT: UNIT NUMBER: MONTH OF REPORT:

PROGRAM BUDGETING	74-75	75-76	76-77	77-78 TO DATE	CURRENT MONTH
TOTAL APPROPRIATION PER PUPIL					
TOTAL EXPENDITURES PER PUPIL					
READING RELATED APPROPRIATIONS PER PUPIL					
READING RELATED EXPENDITURES PER PUPIL					
MATHEMATICS APPROPRIATIONS PER PUPIL					
MATHEMATICS EXPENDITURES PER PUPIL					

SPECIAL PROGRAM DESCRIPTIONS

1974-5:

1975-6:

1976-7:

1977-8:

SCHOOL SAFETY AND ENVIRONMENT	74-75	75-76	76-77	77-78 TO DATE	CURRENT MONTH
# OF ACCIDENTS REQUIRING MEDICAL ATTENTION					
ACCIDENT RATIO					
TOTAL STAFF ASSAULTS					
TOTAL STAFF ASSAULTS INVOLVING CONTACT					
VANDALISM COSTS PER PUPIL					
TOTAL HOURS FOR SECURITY PERSONNEL					
SECURITY COSTS PER PUPIL					
# OF SUSPENSIONS					
# OF SUSPENSION DAYS					
AVERAGE LENGTH OF SUSPENSION					
SUSPENSION RATIO					
BUILDING CAPACITY					

HIGH PRIORITY FACILITIES NEEDS (TOP3)

1975-6:

1976-7:

1977-8:

INDEX	DESCRIPTION	SIGNIFICANCE
Number of positions overstaffed	Number of positions that the school has over the staffing formula. There are staffing formulae which determine how many positions to which a school is entitled based on membership and number of teachers. Information is available for the previous months in the 77-78 column and for the current month in the current month column.	This index will provide information which permits the monitoring of how schools are being staffed. If positions are overstaffed in both the 77-78 column and the current column, the reasons for overstaffing should be investigated. If overstaffing occurs only within the current month, perhaps the situation might rectify itself within the next month.
Number of true vacancy positions	Number of positions for which there is neither a regularly appointed teacher nor a FTB filling the position. Information is available for previous month and the current month.	Information can reveal increasing trends in vacancies at the local school level which may be an indication of a problem at the school. If vacancies appear for both months it may be an indication of a position being held which should be closed.
Staffing formula slippage	Number of students who could be placed within the school before another teacher needs to be assigned.	Due to the nature of the staffing formula, there could be variation in the elementary school of as much as 28 students given the same number of teachers. This would indicate that in the efficacious placement of students, teaching positions could be saved. This can be done in two ways -- establishing common attendance areas among schools or by clustering schools' attendance areas. In view of the establishment of a joint Board-Union committee to study maximum class size programs, this indicator could also be used to compare various staffing formulae being reviewed. This indicator can be provided using a variety of staffing formula. The formula which creates the smallest degree of slippage should probably be selected.
Average class size (ACS)	Number of students in regular placement divided by the number of classroom teachers assigned to classrooms. For a given month, information will be provided in the current month column. Previous year's class size (s) are also provided in the preceding columns. In the column 77-78 to date, information is provided on the previous month's ratio.	Information can be used to show trends over the last four years and changes in ratios over the last month. When the ratio is outstandingly high compared with other schools, reasons might be investigated.
Pupil/teacher ratio	Differs from average class size in that the membership is divided by the number of regular classroom teachers in the school, even if they are not in classrooms. Previous year's ratios are also provided in the preceding columns. In the column 77-78 to date, information is provided on the previous month's ratio.	Same as ACS; however, when this information is used in conjunction with ACS, discrepancies between the two can be noted. The probable cause of the discrepancy is due to the school not having enough space for every regular classroom teacher.
Pupil/paraprofessional ratio	Membership on the last day of the period under study compared with the number of paraprofessionals offering instructional service. Previous year's ratios are also provided in the preceding columns. In the column 77-78 to date, information is provided on the previous month's ratio.	Comparisons can be made across the years for a given school as well as across schools for a given year.
Percent of classroom teachers absent covered by substitutes.	Number of days that classroom teachers were absent and covered by substitutes divided by the number of days that classroom teachers were absent. Information is provided in all five columns.	The first four columns provide yearly averages which can be used for within school comparisons and trends. All five columns can be used for noting the degree of improvement in substitute coverage. By comparing current months across the city, variability for a given month can be observed. For a given unit, if one reviews profiles for several months, a complete picture on a month to month basis can be obtained.

INDEX	DESCRIPTION	SIGNIFICANCE
Number of non-classroom teachers absent covered by substitutes	Number of days absent of teachers filling nonteaching positions (free assistant principals, adjustment teachers, etc.) and for which a day to day substitute was paid.	This is a good place to look for surplus dollars, in that substitutes are very seldom really used for covering the responsibilities of a nonclassroom teacher -- due to lack of expertise or insufficient background information.
Substitute pay	Index is found by multiplying the number of days that a substitute has been employed by the substitute's pay. It should be noted that this figure is derived for substitutes who are employed to cover teacher absences, not teacher vacancies.	Gives information as to the budgetary amount which is being expended for substitute pay. Comparisons across years and between schools can be made. Trends and increasing personnel costs can be observed.
Staffing cost per pupil	The total per pupil staffing cost of regular placement students for each school relates the cost of salaries for Board of Education funded professional personnel serving regular students in each school to the number of regular placement students in that school who are served by those personnel.	Information can be used to determine increasing figures in the major costs of educating a student in a given Chicago public school. Citywide comparisons are also meaningful.
Number of board funded classroom teaching positions	Board of Education funded classroom or subject teachers	Comparisons can be made within and between schools. Trends can also be noted.
Number of board funded auxiliary teaching positions (BAT)	Number of free assistant principals, librarians, counselors, master teachers, etc.	Comparisons can be made between and within schools. Trends can be noted.
Number of board funded special education positions	Number of positions appropriated for serving special education students	Comparisons within and between schools can be made. Trends can be noted.
Number of government funded teaching positions	Government funded classroom or subject teachers	Comparisons can be made within and between schools. Trends can be noted.
Number of board funded paraprofessional positions	The number of board funded teacher aides	Comparisons can be made within and between schools. Trends can be noted.
Age	Current age of principal	Comparisons across schools in administrative age can be made. Trends can be noted, e.g., in average age. One can note when a principal is reaching retirement age so replacement procedures can be initiated.
Sex	Sex of the principal	Necessary information to insure compliance with Title IX. Composite citywide numbers can be compared. Trends in composition of administrative staff can be noted.
Race	Race of the principal	Useful in determining compliance with Title VI of the Civil Rights Act of 1964. Citywide administrative composition can be noted as well as trends across years.
Years as a principal	Years of experience as a principal, not necessarily within the same school	Trends in administrative experience can be noted. Helpful in assessing performance of principals
Turnover rate	Number of changes in teaching personnel compared with the average of the number of positions at the school at the beginning and end of the period under study.	May indicate problems within the school such as poor morale stemming from such factors as changing neighborhoods, poor administration, etc. The high turnover may create educational problems even when the turnover is coincidental.
Absenteeism	Number of days absent of teachers charged to a school (excluding teachers on leave) divided by the number of possible teacher attendance days. Information appears in all five columns of the profile.	Similar to rate of attendance for pupils except that the variable is absenteeism rather than attendance and the population is teachers rather than students. All five columns can be used for noting the degree of improvement in teacher absenteeism. By comparing current months across the city, variability for a given month can be observed.

INDEX	DESCRIPTION	SIGNIFICANCE
		For a given school, if one reviews profiles for several months, a complete picture on a month to month basis can be obtained.
Number of hours lost	Number of teacher days absent multiplied by 5 hours for each day of absence. Information appears in all five columns of the profile.	Number of hours which children are without their regular teacher can be noted. Within school comparisons can be made. If the number of hours is divided by 5 this number represents the actual number of days that the teachers are absent.
Percent minority	Percent of teachers who are classified in one of the minority ethnic groups. Information appears in first four columns of the profile, but not the fifth. Numbers represent percent minority at the time of the survey in November.	Comparisons within and between schools can be made. Trends can be noted. Can be used for determining compliance with state and federal guidelines.
Percent with less than six years' experience	Percent of the faculty who have less than six years of teaching experience. Information appears in the first four columns of the profile but not the fifth. Figures represent percent with less than six years'experience at the time of the survey.	Can be used for comparing percent of inexperienced teachers within and between schools. Trends can be noted. Meaningful in determining compliance with Title VI of the Civil Rights Act of 1964.
Percent with only a bachelor's degree	Percent with approximataly four years college education. Information appears in first four columns of the profile. Figures represent percent with only a bachelor's degree at the time of the survey.	Can be used for determining educational composition of faculty. Comparisons within and between schools can be made. Trends can be noted. Necessary information for determining compliance with Title VI of the Civil Rights Act of 1964.
Percent attendance	Number of student attendance days present divided by the total number of possible student attendance days.	Can be used to compare the degree to which students are attending school. Relevant in determining loss of revenue from the state. Comparisons across years can be made to determine improvement. Among school comparisons can also be made.
Mobility	Number of students who entered and left from September to the current month divided by the membership at the end of September. Information appears in all five columns of the profile.	Can be used as a measure of change in student population from September to the present. Within and among school comparisons can be made. Trends can be noted. It is a good indication of the amount of paper work required of administrators and teachers due to the processing of transactions.
Retentivity/Regular year	Number of students retained during the school year divided by the average daily membership. Information appears in all five columns of the profile.	This is a good measure of stability of the school population. Retentivity should be viewed in conjunction with mobility. Mobility might be deceiving in that it could be the same students who are causing the large percentage of transactions; i.e., multiple transfers in and out; etc. Retentivity, on the other hand, indicates number of students who have been taught at the school for the full year and the number for whom administrators and teachers can be held accountable for their progress. Across years and among school comparisons can be made. Trends can be analyzed.
Retentivity/Summer	Number of students retained over the summer divided by the average of the June membership and the September membership. Information appears in the first four columns of the profile.	Measure of stability of school population over the summer or continuity between school years.

INDEX	DESCRIPTION	SIGNIFICANCE
Percent behind reading level	The percent of students who are functioning significantly below their expected age-level placement in reading. Information is available in the first three columns of the profile.	Poor reading progress can be compared across school years. Improvement can be noted. Comparisons and trends among schools can be noted.
Elementary reading index	Differences between the school's reading median for each age level is determined to obtain "difference scores" with main buildings and branches considered separately. The test index is the median of "difference scores" for the main building and branches converted from years to months. The first three columns of the profile contain information on the elementary reading index.	Can be used as a measure of the school's standing in reading progress. Citywide comparisons can be made.
Reading Median/Age 8	Middlemost score for age 8 when all scores have been arranged in order of size. Information is found in the first three columns of the profile.	Good measure for comparing 8-year-olds' reading progress citywide.
Reading Median/age 11	Middlemost score for age 11 when all scores have been arranged in order of size. Information is found in the first three columns of the profile.	Good measure for comparing 11-year-olds' reading progress citywide.
Reading Median/age 13	Middlemost score for age 13 when all scores have been arranged in order of size. Information is found in the first three columns of the profile.	Good measure for comparing 13-year-olds' reading progress citywide. When used in conjunction with reading median/age 8 and reading median/age 11 can be very useful at the local school level.
Membership trend	A five point scale assessment by the Deparment of Facilities Planning of a school's membership over the next several years ranging from: 1) going down critically, 2) going down, 3) going stabile, 4) going up, to 5) going up critically. Information is found only in the fourth column of the profile.	Good measure for school planning in terms of facilities, equipment, and staff.
Kindergarten and prekindergarten membership	Enrollment of kindergarten and prekindergarten students enrolled within the local school. Columns 1, 2, 3 and 5 contain information on this index. Column 4 contains last month's information.	Can be used as an indicator of preschool and kindergarten level needs. Also shows trends in membership across years. Comparison can be made among schools.
Regular membership	Regular membership includes all the students enrolled in the school who are assigned to regular placement. Information is available in columns 1, 2, 3, and 5 of the profile. Column 4 contains last month's information.	Shows trends in membership across years. Comparisons can be made among schools.
Special education membership	All students enrolled in special education classes. Columns 1, 2, 3, and 5 contain information on this index. Column 4 contains last months' information.	Can be used as a basis for identifying schools which are serving large percentages of children with special needs. Useful in obtaining additional state funding.
Average daily membership	Number of student days in membership compared with the number of school days. Information is available in columns 1, 2, 3, and 5.	Shows trends in membership across years. Comparison can be made among schools. Used as the divisor in many indices.
Average daily attendance	Total number of student days in attendance compared with the number of school days. Columns 1, 2, 3, and 5 contain information on this index.	Critical for funding purposes, i.e., receiving state revenue. Used as the divisor in many indices.
Percent with language difficulties	Percent of students whose dominant language is not English and are having difficulty mastering English.	Useful for receiving state and federal funds and determining need for additional services necessary for compliance with state mandates.

INDEX	DESCRIPTION	SIGNIFICANCE
Percent from low-income families	Families receiving Aid to Families with Dependent Children or General Assistance and poverty families who do not receive welfare.	Useful for determining eligibility of an attendance area for ESEA Title I services. Also important in characterizing the school since this index is highly correlated with achievement scores, school attendance, etc.
Race - Percent minority	Racial and ethnic groups for students is determined in the fall of each school year by observation head count.	Useful for determining compliance with federal mandates.
Percent and ethnicity of the dominant race.	Major racial and ethnic composition of a given school.	Useful for compliance and integration purposes.
Total appropriation per pupil	The total educational fund and textbook fund allocated for educating a Chicago public school student.	Shows trends across years. Comparisons can be made among schools.
Total expenditures per pupil	Total amount expended for educating a given Chicago public school student projected over the school year.	Comparisons between projected expenditures and appropriations can indicate special school problems or needs. Can serve as a means of control of expenditures.
Reading related appropriations per pupil	The per pupil cost appropriated for the teaching of reading and related activities prorated according to standard time allotment schedules.	Forms basis upon which supplemental funds can be secured. Cost and reading achievement can be related within and between schools.
Reading related expenditures per pupil	The total per pupil educational and textbook fund expenditure for the teaching of reading and related activities projected over the school year.	Useful in performing cost effectiveness analyses for various reading programs and/or approaches.
Mathematics appropriations per pupil	Appropriation contained in the budget for the teaching of mathematics and related activities projected over the school year.	Useful in performing cost analyses.
Number of accidents requiring medical attention	A count of the number of students requiring medical attention as a result of accidents occurring on the school premises from one-half hour before the beginning of the school day until one-half hour after the closing as reported to the Department of School Safety and Environment on Report of Accidents to Pupil or Visitor.	Indicator of possible problems within the school.
Accident ratio	Number of accidents requiring medical attention compared with the average daily membership for the period under study.	A factor in determining physical climate within the school. Citywide, comparisons across the years can be made.
Total staff assaults involving contact	Total number of assaults involving contact reported to the Department of School Safety and Environment by the District Superintendents.	Indicator of student morale and possible problems within the local school.
Vandalism costs per pupil	The total costs of vandalism, burglaries, theft, missing items and fire damage at the school, less the cash restitution and recovery of property as determined from the school engineers reports to the Department of Maintenance and Rehabilitation divided by the average daily membership.	Vandalism is source of large expense. Comparison can be made among schools and across years.
Total hours for security personnel	Number of hours of security service received by the schools and type of service (Policeman, Retired Policeman, Civilian, CETA, etc.) as determined from the records kept by Operational Services.	Viewed in conjunction with the two above indices, can be used as an indicator of the cost effectiveness of security services.

INDEX	DESCRIPTION	SIGNIFICANCE
Security costs per pupil	The projected yearly cost for security compared with the average daily membership.	Can be used as a measure for cost effectiveness of various security approaches within and among schools.
Number of suspensions	Number of suspension notices submitted by the principal and approved by the district superintendent for the period under consideration.	Indicator of behavior problems within a school.
Number of suspension days	Sum of the days students were suspended as indicated on the suspension notices submitted to and approved by the district superintendent for the period under consideration.	Indicator of frequency and severity of behavior problems.
Average length of suspension	Total number of suspension days compared with the number of suspensions.	Indicator of the severity of behavior problems.
Suspension ratio	Number of suspensions compared with daily membership during the period under study.	Indicator of behavior problems within the school and possible external funding problems.
Building capacity	For elementary schools, number of rooms not utilized. For high schools, BAT times number of rooms compared to membership.	Useful in facility planning and organization.
Facility needs	The three highest priority permanent improvement and capital activity items submitted jointly by the principal and engineer to the district on form SP101, their cost and whether or not they appear in the budget.	Useful for promoting initial investigatory procedures for purchasing and/or planning.

DESIGN FOR PROGRAM IN MANAGEMENT DEVELOPMENT

CHICAGO PUBLIC SCHOOLS

All across America today urban school systems are being called into question. While the cost of educating each child increases, the graduating product is far below standard, and in too many cases that product is unemployable. However we place the blame for this social malady, rectifying it will call for a new model of developing managers skilled enough to cope with the changing role of school administration. The job of a principal today, for example, is simply more complex than ever before.

Study after study has shown that teachers and administrators at all levels too often lack the training and skills required to cope with community demands, racial problems, goal setting and other important managerial attributes. A clear manifestation of this problem can be seen in the rising absenteeism of both students and teachers. Under such conditions, it is not possible to improve the product, nor to reduce costs; and costs there are.

For example, in the Chicago Public Schools there are approximately 130,000 high school students with an absenteeism rate of 15% per day. At a rate of $7.00 per student in lost state revenue, the system looses $136,500 per day, or $24,480,000 per year. Improved management skills of all types could reduce this figure. Elementary school absenteeism is not as bad at 9.6%. However, a reduction here would also save additional funds.

As for absenteeism of teachers, the Chicago Public Schools pay substitute teachers $42.00 per day for a total of approximately $65,000

per day, or $11,700,000 per year. Clearly a well trained manager, utilizing the best in motivational skills, could reduce these costs dramatically.

The problem is compounded by declining enrollment, decreasing mobility of teachers, and lagging revenues. Declining enrollments imply decreases in the number of new teachers hired, resulting in a decline in the pool of relatively young candidates for administrative positions. Decreasing mobility implies fewer vacancies which in turn implies fewer opportunities to improve the overall skill level of the organization through recruitment of new personnel.

Lagging revenues make it difficult to locally fund positions within school systems designed to attack these problems. This implies fewer opportunities to improve the overall competence of personnel within and by the system.

As the concepts and regulations of affirmative action are translated into specific personnel decisions, patterns of internal career advancement will be altered. This can increase the career opportunities of some personnel while decreasing them for others.

These trends have important ramifications for school systems and school personnel across the country. From the standpoint of the Chicago public schools, these trends suggest;

1. Reduced ability to upgrade the capabilities of its personnel pool through external recruitment at all levels.
2. Increased need to redefine existing roles within the organization and to staff them with existing personnel.
3. Reduced ability to address preceived weaknesses in the system by adding organizational units without reducing or eliminating other units within the organization.
4. Increasing complexity of role descriptions reflecting both more specialized tasks and greater coordinative responsibilities.

From the standpoint of school personnel, these trends suggest:

1. Reduced or altered potential for internal mobility within the system.
2. Increasingly inadequate individual initiatives to improve skills in current positions.

The individual and the organizational implications are interrelated and require a strategy of personnel development which addresses both.

The Chicago Board of Education asked itself how could it impact a very large urban school system to bring about sufficient change to improve the product and reduce costs by improving manage-

ment and the professional and nonprofessional staff?

Historically, school systems, including the Chicago Public Schools, have encouraged personnel to develop their capabilities pretty much on their own by:

1. Taking advanced course work through departments of education. Individuals enroll at programs at nearby institutions of higher learning, undertaking courses of study and often acquiring graduate degrees.
2. Attending sessions at professional association meetings devoted to various aspects of educational management.
3. Attending "imported" personnel development programs brought into the school system on a consultancy basis to conduct sessions on management development.
4. Attending management seminars and courses designed by school board staff. The system identifies immediate training needs and develops short working sessions to deal with them.

Each of these practices has fulfilled some important needs in many school systems. Programs at institutions of higher learning provide important job-related, albeit general, information regarding the structure and operation of schools. Professional meetings provide a means for individuals to upgrade skills and acquire information on topics of current interest to the profession. Inservice seminars, whether contracted or developed in house, provide a

mechanism for introducing, or reinforcing general concepts in relatively short, intensive doses.

Despite the utility of these traditional mechanisms, they no longer satisfy the needs for personnel development programs within the larger urban school systems. Recognizing this dilemma, the General Superintendent of the Chicago Public Schools reached out into the greater Chicago community for help. In response, the "City that works" provided a management expert for appointment to the Board of Education; a "think tank," the Center for Urban Education, was established by the board and funded by the community; and an administrative university was created. Finally, the Superintendent asked the business community to review personnel development within the system, with an eye toward recommending improvement. A business committee chaired by a personnel specialist from Arthur Anderson & Co., submitted a Plan to the Center for Urban Education, which in turn, modified it somewhat, after review by selected Board of Education personnel. That effort culminates in this proposal.

By any definition, the Chicago Public School System is a big business, with an annual budget exceeding 1.2 billion dollars and employing over 50,000 people to provide educational service to over 500,000 children. It operates over 600 physical plants.

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responsibilities span all operational phases of the system.

The project encompasses ten tasks which involve identifying each job task, analyzing the job skills necessary to perform each job, forecasting employment needs, and developing instructional programs for each job. These are outlined on the following page. This planning and design stage takes three years to complete. It will be operated through the Center for Urban Education and administered by an Assistant Superintendent who will report directly to the General Superintendent. Again the goals are:

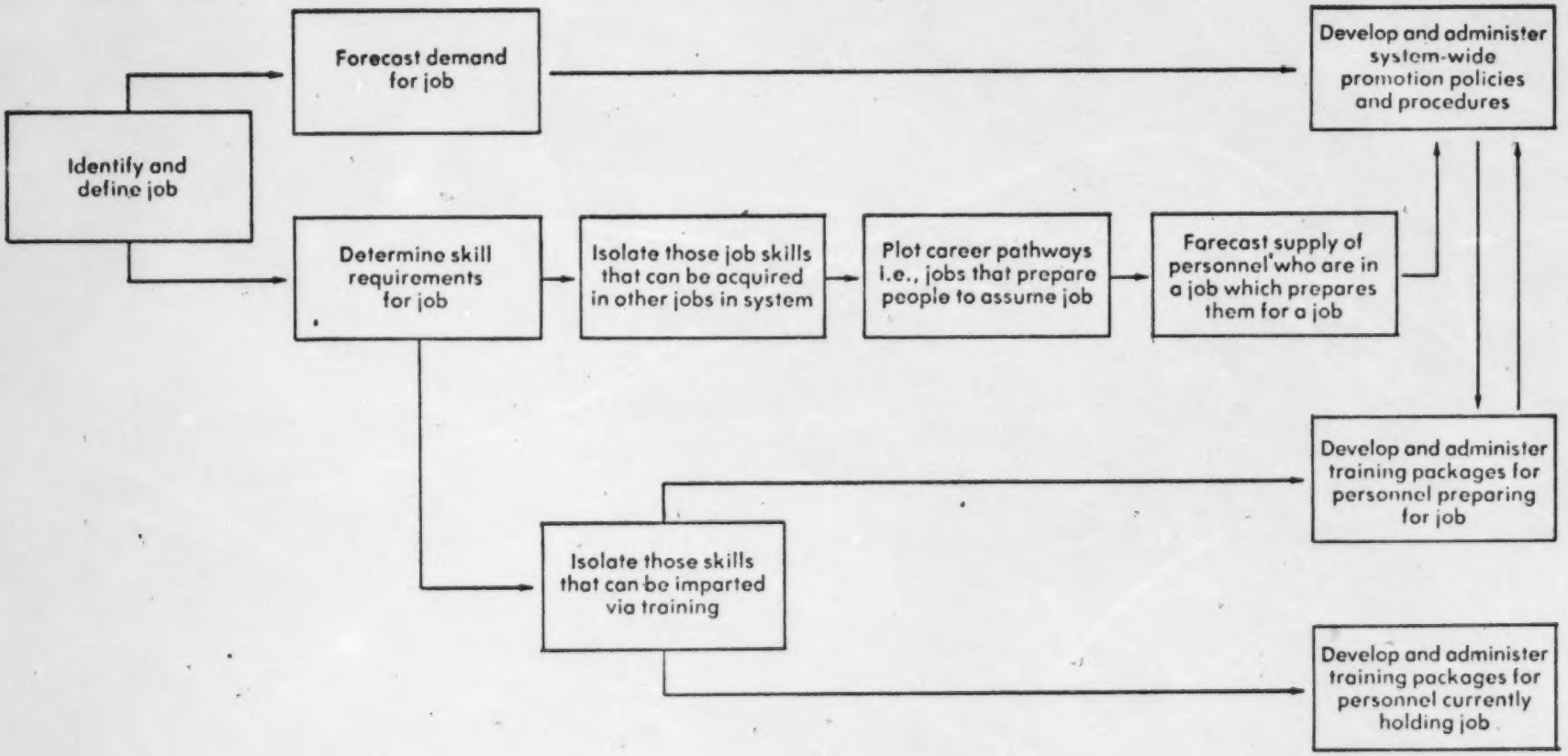
1. Improve the graduating product by upgrading the management skills of school personnel; and
2. To cut costs.

Proposed Scope of Work

In general, the first year of the project is devoted to research and design; the emphasis of the second year is on development; and the third year is devoted to implementation of the system. There are five major interrelated components of the projects; job identification, skills analysis, quantitative methods for record keeping and analysis, curriculum development and overall project management.

MANAGEMENT DEVELOPMENT PROGRAM

(Described in Terms of a Single Job)


Identify and define job
Forecast demand for job
Develop and administer system-wide promotion policies and procedures
Determine skill requirements for job
Isolate those job skills that can be acquired in other jobs in system
Plot career pathways i.e., jobs that prepare people to assume job
Forecast supply of personnel who are in a job which prepares them for a job
Develop and administer training packages for personnel preparing for job
Isolate those skills that can be imparted via training
Develop and administer training packages for personnel currently holding job

The first chore will be to identify each job and define its perimeters within the system, consolidating responsibilities in some cases and breaking others into smaller components. The major objectives of the job skills analysis component include: identifying the major skills required for each job; determining which skills can be acquired by previous job experience and which can be acquired by training; and designing the system for ongoing job skill analysis. Work on these two components will commence immediately, moving into the development phase before the second year and decreasing in relative emphasis during the third year. The Department of Personnel and the offices of the four Deputy Superintendents will be involved heavily in this component.

The major objectives of the quantitative methods component include: developing methods for forecasting multiyear internal demand and supply of personnel for each position; identifying long run changes in internal labor mobility; and designing a system for ongoing computer based record keeping to be used also as a tool for analytic functions. Work on this component will commence the second year with a series of analyses of long run changes in the internal work force and with preliminary designs for forecasting future changes in it. The second and third years will be devoted to developing necessary softwear to supply the data necessary to operate the program. The Department of Personnel, Financial Planning, Data Processing, and Administration will be heavily involved in this component.

As trainable skills are identified for each job, curriculum pack-

ages will be designed, developed and pilot tested. The major objectives of the component include designing and developing an initial set of pre-service and in-service curriculum packages, and designing a system for ongoing course operation, evaluation, and modification. Virtually every unit in the Chicago Public Schools will have some involvement in this component. Work in this component will begin in the first year and continue throughout the planning period, as courses are added to the bank of curricular packages for management development.

The objectives of the overall project management component include designing and developing the additional task areas which are required for the successful completion of the project; and implementing the management development program within the operations of the Chicago Public Schools. The work of this component will grow steadily over the three-year period and will involve the following units most heavily: The Department of Personnel, Offices of the Deputy Superintendents and the General Superintendent.

To complete the design and implementation project as just outlined, the ten tasks which have been alluded to earlier now begin. The first is to identify and define each job within the system. Next is to forecast job demand, followed by determining the skill requirement for each job. These job skills will be isolated into those which can be acquired in other jobs within the system and those skills which can be imparted by special training. In the first instance, the next task is to plot career pathways-jobs that prepare people to assume more responsi-

bility. Next it will be necessary to identify the supply of personnel in jobs that are preparing them for new responsibilities.

For jobs skills requiring special training, two additional tasks of developing and administering training packages will be undertaken for (a) personnel preparing for a job, and (b) personnel currently holding a job. The final task will be to develop and administer a new system-wide promotion and procedures policy.

The project will be staffed as follows:

TITLE	RESPONSIBILITY
Project Director/Assistant Superintendent for Management Development (Three man years)	1. Successful completion of the overall project. 2. Primary liaison with other units in the Chicago Public Schools as well as with external groups.
Job Skills Analyst (Two and one-half man years)	1. Successful completion of the job skills analyst component. 2. Liaison with Personnel Department
Quantitative Methods Analyst (Three man years)	1. Successful completion of quantitative methods component 2. Liaison with Data Processing Department
Curriculum Development Specialist (Two and one-half man years)	1. Successful completion of curriculum component. 2. Assistant to Project Director

The concept of this project is, in a large measure, the direct outgrowth of the General Superintendent, who, less than eighteen hours after taking office, publically stated that he would work to establish a staff development program. "I would hope," he said, "that one of the things that is done every early is to set up a high level program of staff development." Within the past three years, much effort has been expended by the Chicago Public Schools to improve the capabilities of its personnel. Three (3) of these efforts bear directly upon this proposal:

a. Administrative University,

b. the computerized program planning and control system, and

c. the identification of staff responsible for planning and implementing the program in personnel development.

Together these efforts provide a solid base upon which to build a comprehensive management development program.

The Administrative University, operating since the summer of 1976, is the first attempt in any major school system to develop and administer comprehensive and continuing training programs for its administrators. It is perhaps the most tangible evidence of intent within the Chicago Public Schools to work toward a fully implemented management development program.

In 1976, nearly 650 school Principals went back to the classroom for two full weeks of instruction in principles of management. An in-depth assessment of skill requirements was then undertaken, leading to training programs for all Principals during the following summer in the

high need areas, such as teacher evaluation, dealing with the media in crisis situations, and recent trends in due process procedures in schools. During this school year, one day in-depth sessions on patterns of management action are being presented to all Principals as reinforcement of previous work. This has all be undertaken with increased planning with the Principals themselves.

More recently, the Administrative University has been expanded to include other positions. The top 65 Administrators in the Chicago Public Schools recently spent three days and nights in an intensive program for top level executives on planning and management. Each of these administrators is now designing one-day programs for personnel within his or her area of responsibility. In a word, the Administrative University is intended to be the professional school for current and potential managers in the Chicago Public Schools. Its program of study is growing and being refined. Progress has been made in identifying and providing for the training needs of system personnel. It is important to point out that this effort represents only one of the ten task areas of personnel/management development suggested earlier in this proposal. That one area is developing and administrating training packages for personnel currently holding a given position.

The program planning and control system represents a second major base upon which to build a comprehensive management development program. A multi-million dollar project requiring half a decade of development, the program planning and control system will supply much of the personnel

data required in the management development program. Relevant computer-based capabilities of the program planning and control system include:

1. An inventory of all employees with selected personnel, payroll, job skills and job history information.
2. Files of positions and position openings.
3. A history of modifications in staffing patterns.

Only with this kind of computer capability is it possible even to conceive of a personnel development program which potentially involves over 50,000 employees. Each of the ten task areas will be supported by this computer-based information system. It will provide some of the data for job demand and supply forecast; it will be used to store the job skill and training data on each employee in the system; and most importantly, it will provide the overall record keeping for a comprehensive management development program.

DESIGN FOR ASSESSING LONG RUN CHANGES IN THE COMPOSITION OF THE LABOR FORCE IN THE CHICAGO PUBLIC SCHOOLS

ASSESSING LONG RUN CHANGES IN THE COMPOSITION OF THE LABOR FORCE IN THE CHICAGO PUBLIC SCHOOLS: A PROPOSAL

BACKGROUND

Major economic demographic, and social changes over the last decade have greatly influenced the composition of the work force in urban school systems. Examples of these changes include: (1) declining student enrollment, (2) decreasing labor mobility, (3) increasing job complexity, (4) lagging revenues, (5) changing employment criteria, and (6) changing instructional programs. Each of these factors affect the managerial requirements of school system personnel. However, the effects are not uniform. For example, declining enrollments imply decreases in the size of the teacher pool and hence a decline in the size of the pool of relatively young candidates for administrative positions. Relatedly, decreasing labor mobility implies fewer vacancies, which, in turn, implies fewer opportunities to improve the overall skill level of the organization through recruitment of new personnel.

Increasing job complexity manifests itself in greater specialization of the work force, increasing regulation, and enlarged information systems. These factors increase the skill requirements of personnel. Because of lagging revenues, it is increasingly difficult to locally fund newly created positions within school systems. This implies fewer opportunities to improve the overall competence of personnel in the organization by this device.

As the concepts and regulations relating to changing employment criteria, e.g., are translated into specific personnel decisions, patterns of internal career advancement are altered. This can increase the career opportunities of some personnel and decrease them for others.

Emergent programs (e.g., bilingual education) and funding sources (e.g., Comprehensive Employment Training Act) create new jobs. Some of these jobs may be filled by applicants already employed by the school system. Other jobs draw on extra-organizational labor pools.

We have speculated about the general effects of each of these factors on the internal labor forces within large urban public schools. However, we are simply not able to specify with any precision the combined effects of these factors over time. Yet, knowledge about developing trends in the composition of the public education labor force is critical. Such knowledge is important to local, state, and federal policy makers whose actions are indirectly reflected in staffing decisions. It is important to district level administrators concerned with rationalizing the structure and function of school districts. It is important to individuals wishing to enter and advance within the field of public education. One way of anticipating future changes in the composition of the labor force is to examine the effects of these factors in the recent past.

OBJECTIVES

The proposed study is designed to accomplish three objectives. One is to describe changes in the number and types of positions required to operate the Chicago public schools over the last 10 years, including a description of the procedures whereby specific positions are created, filled, and closed. The second objective is to isolate the most significant of these changes and attempt to describe their causes. The third objective is to measure the stocks and flows of individuals into the school system labor force, through positions within the school system and out of the school system labor force.

No single theoretical construct will guide the project. However, two organizing concepts, drawn largely from economics, will guide much of the analysis of the way in which individuals move through the school systems: internal labor markets and human capital. (The general tenets of these organizing concepts are summarized in Appendix A.)

ACTIVITIES OF THE PROJECT

Five separate activities will be required in order to accomplish the objective of the project.

1) Prepare personnel files for analysis. This involves: securing the personnel files for each individual employed on a full-time basis by the Board of Education since 1967; extracting data elements relevant to the analyses; and creating new files which are compatible

with the analytic software.

2) Identify events which are likely to have had a major impact on the composition of the labor force. This involves: interviewing central office administrators who are familiar with past and present factors affecting personnel procedures in the system; and developing classification schemes of personnel which are likely to reflect the effect of those factors.

3) Conduct preliminary analyses which portray personnel flow as a finite Markov Chain. (See Appendix B for a brief description of Markov processes.) This step entails using a computer program previously developed to analyze the flow of Air Force personnel (see Hall, 1971a, 1971b and Merek and Hall 1971); and preparing initial descriptions of flows using a variety of classification schemes.

4) Develop and test specific hypotheses of personnel flow grounded in theories of internal labor markets and human capital. This entails: integrating information gleaned from Activity 2 with the theoretical constructs drawn from economics; and developing concrete, testable hypotheses of personnel flow.

5) Prepare a report on the findings of the study.

APPENDIX A

APPLYING BASIC THEORETICAL CONCEPTS TO THE STUDY OF PERSONNEL IN LARGE ORGANIZATIONS

Primary reference: David Greenberg and John McCall, Analysis of Educational Personnel Systems, Vol. I, Santa Monica, Rand, R-1071-HEW, 1-73.

I. Internal Labor Markets

Classical economists viewed labor markets as highly competitive arenas in which workers searched for high wage jobs and employers searched for highly productive workers. Markets are highly fluid with wages primarily determined by the principles of "equalizing differences" (tendency toward equilibrium).

An alternative explanation of wage determination is based on the principle of "non-competing groups." Workers and employers are, in this interpretation, unable to engage in uninhibited search within a fluid labor market. Rather, they are constrained by geographic, social, occupational, and institutional factors.

The concept of internal labor markets is a refinement of the principle of "non-competing groups." Clark Kerr was one of the first writers to introduce the concept of internal labor-market.

Labor markets are of two broad types: (1) the structureless and (2) the structured. In the structure-

less market, there is no attachment except the wages between the worker and the employer. No worker has any claim on any job and no employers has any hold on any man. Structure enters the market when different treatment is accorded to the "ins" and the "outs." In the structured market there always exists (1) the internal market and (2) the external market. The internal market may be the plant or the craft group, and preferment within it may be based on prejudice or merit or equality of opportunity or seniority or some combination of these. The external market consists of clusters of workers actively or passively available for new jobs lying within some meaningful geographical and occupational boundaries, and of the port or ports of entry which are open or are potentially open to them... The more structured the market, the more precise will be the rules on allocation of opportunity within the internal market and the fewer will be the ports of entry and the more rigid will be the requirements for admission. Institutional rules do not usually introduce structure into a market--it often arises from the individual preferences of workers and employers--but they uniformly add to it. (Kerr: 261-2).

Kerr identified three different types of internal labor markets: "open," "manorial," or "guild." The open market is unstructured and competitive; all jobs are filled directly from the external labor market. Manorial markets emphasize vertical stratification. Ports of entry into this market are confined to the lower job classification and movement within the market takes place along a job ladder. There are elements of the manorial system in education, e.g., teachers becoming principals, who in turn become superintendents. Guild markets are stratified horizontally. Admission into the guild system tends to be closely controlled through training and other requirements, and workers tend to be highly skilled. Workers within a guild would move relatively freely from firm to firm so long as they had proper credentials. There are several analogous situations for teachers: movement among school districts and movement among teaching assignments. Movement can be initiated either at the school district's request or at the teacher's request, although in practice, the distinction is not clear. There, of course, are a wide variety of reasons for either to initiate the change.

II. Human Capital

A second organizing concept that will be used relates to the theory of human capital, i.e., the recognition that each indivdual has embodied within him a valuable economic resource that yields returns over his lifetime. Investments in human capital include

formal education, vocational training, on-the-job training, health care, migration, and information accumulation.

The theory of human capital can be useful to us in our work if we make the distinction between "general" and "specific" human capital. General human capital encompasses all those investments that bring the same return in all occupations. Specific human capital comprises those investments in human capital having a higher return in one occupation, or even in one specific assignment, than in any other.

The concept of specific human capital is relative. Knowledge of the idiosyncrasies of a certain school principal is a form of human capital specific to that school. It is, however, general human capital with respect to alternative assignments within that school.

Large investments in specific human capital impede movement from the set of jobs for which the investments are specific. Similarly, movement into this set of jobs is also inhibited by specific human capital requirements. These human capital barriers to mobility partition labor markets into relatively autonomous sub-markets (internal labor markets).

The analysis of mobility within large organizations (e.g., U. S. Navy, the Chicago Public Schools, and the University of Rochester) can be facilitated by observing the correspondence between internal labor markets and the barriers to mobility induced by specific human capital.

Using These and Other Organizing Concepts

These general concepts provide a base upon which to construct and test specific theories of personnel movement within large organizations. Also, they can buttress concepts developed in other disciplines, such as "stayers vs. movers" and "cosmopolitans vs. locals" in sociology. Initial analysis of the data bases would identify additions to human capital as well as barriers to internal mobility. However, specific testable theories would need to be developed.

APPENDIX B

USE OF MARKOV MODELS IN CAREER ANALYSIS

A Markov Chain is a mathematical model for describing a certain type of process that moves in a sequence of steps through a set of states. Markovian models are used to analyze the current movements of some variable in an effort to predict the future movement of that same variable. In a finite Markov chain we have a finite number of states which we may denote by $s_1, s_2, \ldots, s_r$. When the process is in state s_i there is a probability p_{ij} that the next position will be state s_j. The matrix $P = (P_{ij})$ is called a transition matrix. Its entries are non-negative and its rows have sum 1. To specify the process completely, we must give P and the starting state.

Matrix operations (addition and multiplication) play a basic role in this theory. For example, the probability of moving from state s_i to s_j in n steps is given by the ijth entry of the transition matrix P raised to the power n^2. If p is a row vector whose components give the probability of being in the various states at the present time, the product of this row vector and the transition matrix, written pP, gives the probabilities after one step, and pP^n after n steps.

Like a Markov model the "flow" of personnel through a school system may be seen as a sequence of steps through a set of states. A state is defined for our purposes as a subset of the population under consideration whose members are differentiated from all other members of the population on the basis of one or more characteristics of the

individual members of the population. Each member of the population must be a member of one, and only one, state of the system. Thus, for example, each teacher could be classified as a member of a set of states reflecting say, type of school. States are then characterized as, for example, "inner city school," and "outer ring school." Therefore mobility in the personnel system is a representation of the promotion system as it is reflected in the proportions, or probabilities, of movement from state to state through the system over a specified interval of time.

State definitions may include more than one characterizing variable. For example, subject matter specialization may be determined to be a relevant variable in determining retention rates of teachers. The states generated by subject matter specialization and type of school would expand as follows: reading teacher, inner city school; math teacher, inner city school; reading teacher, outer ring school; etc. Because the specificity of a transition probability depends upon the variables used to define the system of states, it is possible to change the level of the measure's generality by adding variables to or removing them from the state of definition.

Analysts and managers can interpret the probabilities of transition among states in one of two ways: they may be compared with similar measures for different cohorts or for a similarly defined cohort at a different point in time. Thus, in our example, one might compare the migration behavior of teachers with different specialization. This could take the form of comparing probabilities of move-

ment to particular schools for the members of states that are identical in all respects except specialization. Or one might compare identically defined transitional probabilities in each of several different time intervals in order to estimate the existence of changing behavior patterns on the part of the population.

There is some precedence for applying Markov chains in the manner described above. Indeed Markov chain theory has been used to study a variety of types of problems, several of which have direct applicability to this proposal. Some of these references are listed in Appendix C.

APPENDIX C

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